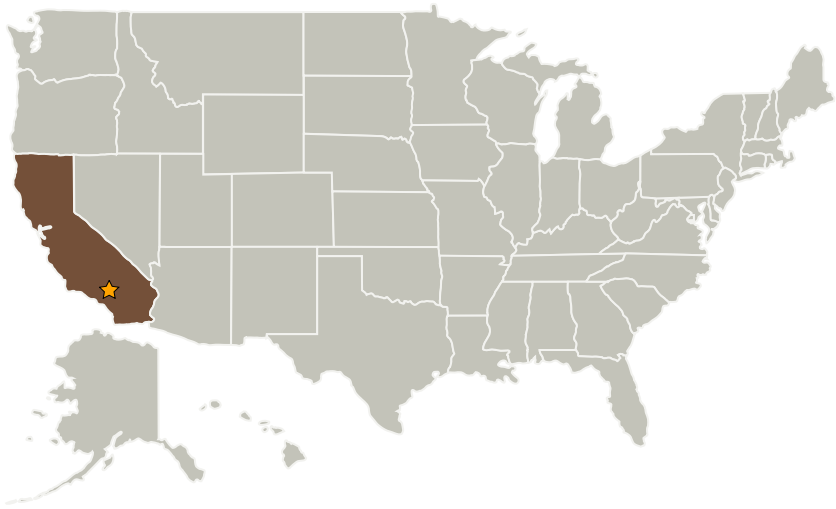
An All Electronic, Adaptive, Focusing Schlieren System for Flight Research, Phase I

Completed Technology Project (2008 - 2008)

Project Introduction

This is a proposal to develop an electronic, focusing schlieren system for flight research based on electronic cameras and spatial light modulators as dynamic programmable masks. Schlieren methods are widely used to visualize turbulence and shock phenomena. Focusing schlieren systems are ideal for applications requiring a large field of view, and are the preferred methods for outdoor schlieren systems. One schlieren technique for large field studies is the use of focusing schlieren with background grids. Recently, schlieren systems that use the sun as a background source have been developed for studying shock waves for aircraft in flight. The application of both schlieren techniques is restricted by the capabilities of fixed schlieren cut-off masks. Liquid crystal spatial light modulators afford greater flexibility, as the correct cut-off mask can be programmed and updated electronically. Since the spatial light modulators can be updated at video rates or faster, there is also the possibility of using the SLMs to correct for changes in the background. In addition, we will incorporate state of the art electronic cameras.

Primary U.S. Work Locations and Key Partners



An All Electronic, Adaptive, Focusing Schlieren System for Flight Research, Phase I

Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Armstrong Flight Research Center (AFRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

An All Electronic, Adaptive, Focusing Schlieren System for Flight Research, Phase I

Completed Technology Project (2008 - 2008)

Organizations Performing Work	Role	Type	Location
★Armstrong Flight Research Center(AFRC)	Lead Organization	NASA Center	Edwards, California
MetroLaser, Inc.	Supporting Organization	Industry Minority-Owned Business, Small Disadvantaged Business (SDB)	Laguna Hills, California

Primary U.S. Work Locations
California

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Drew L'esperance

Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
  - TX13.2 Test and Qualification
    - TX13.2.1 Mechanical/Structural Integrity Testing